

AN EXPLORATORY STUDY ON THE EFFECTIVENESS
OF EMBEDDING IN ADVERTISING

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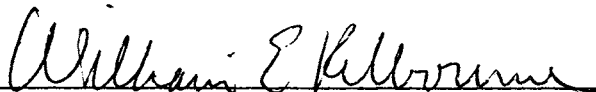
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Scope and Method of Study: This study performs a test of the effectiveness of embedding in advertising. The sample consisted of 69 students enrolled in upper division Marketing classes in the College of Business Administration at Oklahoma State University. The testing was in two phases. First, two sets of matched advertisements were rated on semantic differential scales to measure attitude. Second, a paired comparison test was utilized to determine the effect of the embed on preference.

Findings and Conclusions: The results were not inconsistent with expectations. Each phase of the testing supported the position that the effectiveness of embedding in advertising is questionable. The findings in the first phase did not indicate a positive relationship between the embed stimuli and the perception of the advertisement. The results from the paired comparison tests illustrated that preference was little more than chance.

Adviser's Approval



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INTRODUCTION

Since the flurry of studies during the late fifties and early sixties, research interest and experimentation by the marketing profession in the field of subliminal stimulation (perception) has been virtually nonexistent. Two key factors can account for this: 1) the somewhat overwhelming evidence in support of the position that such methods lack effectiveness in stimulating action, and 2) the public outcry and reproval of the use of subliminal stimulation in any attempt to manipulate the masses.

One exception to this pattern has been the work of Wilson Brian Key. In 1972, Key published the first in a series of three books examining the use of subliminal stimulation in advertising. By citing numerous examples of what he refers to as subliminal embeds (emotionally loaded words or pictures in the background of ads), Key provides clear, irrefutable evidence that at least some advertisers or their agencies have begun to use the embedding of symbols of sex and death in their print advertising. Although numerous print ads use the stimuli in a symbolic manner, which might be open to interpretations, others cited use explicit figures which, once noted, leave little symbolic interpretation to the viewer.

Such embeds as female breasts, male genitals, and nude images have been discovered in several ads. It should be reiterated that this does not refer to symbolic stimuli but rather to the actual anatomical images which can be seen and readily identified by viewers once they know where

and how to view the ads. Thereby by the accepted definitions of subliminal perception and subception, these stimuli are not subliminal. Subliminal implies being incapable of consciously perceiving a certain percentage of the observations. This percentage usually falls somewhere in the vicinity of fifty percent. Even if the viewer was aware that subliminal messages were being presented, conscious perception would normally occur only half of the time. Once the viewer is aware of the existence of subliminal embeds, they are consciously perceptible. A more appropriate paradigm would be the ambiguous figures evidenced in most introductory psychology tests which, when viewed in one manner, manifest one figure, and upon reorientation, create a totally different one. Therefore, embedding is more analogous to manipulations of figure and ground than to the concepts of subliminal perception.

Since there is such a fine line between the concept of subliminal perception and figure and ground manipulation, the first portion of the literature review will cover subliminal perception in order to aid in the development of a theoretical foundation to differentiate between the two. Following there will be a specific discussion of what Key refers to as subliminal embedding, then a discussion of the underlying concepts of figure and ground manipulation, along with its relationship with embedding. The final portion of the review will discuss the relevant theories of attention and perception as they pertain to this study.

LITERATURE REVIEW

Background of Subliminal Perception

Subliminal is used to describe something existing or functioning

outside the area of conscious awareness while perception is defined as the process of information extraction. So subliminal perception is the process of information extraction below the conscious level. It is by no means a recent discovery since the concept of the subconscious has been known for hundreds of years. A more scientific description uses subliminal perception for experiments "in which a supraliminal or masking stimulus is used in connection with a subliminal stimulus."¹

Miller's experiments in 1939 on subliminal perception utilized a sheet of glass which appeared to be a mirror when viewed by his subjects. He projected stimulus figures on the reverse side of the glass at various levels below the conscious threshold and asked subjects to report any configurations they might observe in the mirror. The study showed that as the level of illumination of the stimuli was increased from zero, the percentage of recognition became better than chance. Miller concluded that there are at least three perceptual conditions: (1) complete unawareness, (2) unawareness but the ability to discriminate, and (3) both awareness and discrimination.² Smith and Henricksen concluded similarly in that as the exposure time of the figures increased and approached the threshold level of the conscious, awareness increases.³ Research interest waned during the war but soon returned with a flurry of studies in the late 1950s and early 1960s.

Subliminal perception in marketing was first illustrated by American market researcher James Vicary. Through the use of a tachistoscope, a device for flashing invisible messages on a screen, Vicary placed invisible messages into the subconscious. After the publication in 1958 of Vance Packard's book, The Hidden Persuaders, the American public was shocked at the implications involved in the possible commercial use of

subliminal techniques. Legislation was introduced in a half-dozen states to prohibit the use of subliminal techniques in the public communication media, though none ever became law.

During the early 1960s, initial experiments with mechanically induced subliminal perception were based upon the tachistoscope, which is simply a film projector with a high-speed shutter which flashes messages every five seconds at 1/3000th of a second with the ability to obtain different effects.⁴ The tachistoscope was initially used to flash messages superimposed over motion pictures in theaters. The high-speed messages were invisible to the conscious mind, but supposedly planted messages in the viewers unconscious which were acted upon by a significant number of people. During one six-week test of the machine in a theater, involving 45,699 patrons, messages were flashed on alternate days: "Hungry? Eat Popcorn," and "Drink Coca-Cola." During the six weeks, popcorn sales increased 57.7 percent and Coca-Cola sales 18.1 percent.⁵

The main point throughout this discussion is that subliminal perception occurs below the level of consciousness. Each of the examples cited involved studies (either generally or specifically pertaining to marketing) in which supraliminal or masking stimuli were used in connection with the subliminal stimulus. Key's concept of subliminal embedding utilizes the idea of a masking stimulus, but once the viewer is aware of the existence of the stimulus, he can consciously perceive it. So this discussion will attempt to develop a theoretical foundation for the awareness process.

Subliminal Embeds

Key generally refers to embedding as the practice of hiding emotionally loaded words or pictures in the background of ads.⁶ Sex is the most frequently embedded word in the American advertising industry. Multi-dimensional printing techniques permit advertising artists to plant taboo words or symbols dozens of times within an individual layout.

Embedding can be accomplished by an artist, who paints the illusion upon ice cubes and other props or designs in the layout. Photographically, embedding can be accomplished through a printing procedure known as a double exposure. First the initial (primary) image is exposed on the photographic paper. After this has taken place, additional images (embeds) are exposed on the original print for an extremely brief period of time. It is these additionally exposed images that will constitute the embed(s) since they will make only faint impressions as compared with the original image.

Key points out that some readers will see the embedded stimuli instantly, yet most readers require several weeks to learn how to relax their perception to the point where embeds become immediately apparent. A few readers will, unfortunately, never be able to expand their conscious awareness to the point where they will become consciously sensitive to subliminal stimuli.⁷

While the technique of embedding does utilize the idea of a masking stimulus, Key points out that the viewer can become consciously aware of what he refers to as the subliminal stimuli. Once this conscious distinction is made, the stimulus is in Miller's third condition of perception, where both awareness and the ability to discriminate occur. Those readers who take several weeks to consciously perceive the stimuli

fall into Miller's second condition of awareness, unawareness but have the ability to discriminate. Once the conscious distinction of the stimuli occurs, these individuals will fall into Miller's third condition of awareness and the ability to discriminate. Those who will never consciously perceive the stimuli can be placed in Miller's first condition of complete unawareness. These embeds that fall into Miller's first and second stages of awareness can be considered subliminal due to the fact that the process of information extraction is below the conscious level. The consciously perceivable embeds that fall into Miller's third condition of awareness and discrimination cannot, by definition, be referred to as subliminal. These consciously perceived embeds are more analogous to the technique of figure and ground manipulation when the viewer is aware of the existence of the stimulus, it is clearly perceptible.

Figure and Ground

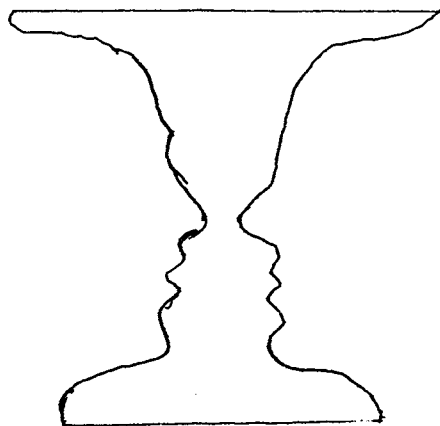


Figure 1. Rubin's ambiguous figure, the "Peter-Paul Goblet"

In order to define the significance of imbeds and ambiguous figures, the following section is developed this relationship. One of Rubin's ambiguous figures can best illustrate the concept underlying figure and ground. Viewed in one manner, it manifests the figure of a vase and

and upon reorientation, creates the figure of two silhouettes. First, the figure has shape while the ground is relatively shapeless. One does not see the image of the silhouettes when the figure is seen as a vase. Second, the ground seems to extend behind the figure's edge. Third, then, the figure has some of the character of a thing, whereas the ground appears like uniform material. Fourth, the figure usually tends to appear in front and the ground behind. Last, the figure is more impressive, more apt to suggest meaning, and better remembered.⁸ The first and last points are relevant in the present study. The area that is not a figure becomes, in effect, invisible, though it is present in the field of perception. Since it does not appear to provide a stimulus to which the subject can respond, the use of embeds may make the product better remembered.⁹ It is this theory of figure and ground reversal that is significant in the present study.

An important concept from this classification is that the perceptions of the figure and the ground do not have shape in the same way. In a certain sense, the figure has shape while the ground does not. A field which had previously been experienced as ground can function in a surprising way when experienced as figure.¹⁰ The effect is dependent upon the shape of the figure which is now experienced for the first time. This is the difference between subliminal perception and figure and ground manipulation. In subliminal perception the stimulus, while not consciously perceived, may be subconsciously attended to. Figure and ground manipulation involves the reorientation of the selected stimulus from ground to figure so that it can be consciously attended to.

It is useful to consider contour when characterising the fundamental difference between figure and ground. Contour is defined as the common

boundary of two fields. One can as a fundamental principle then state:

when two fields have a common border, and one is seen as figure and the other as ground, the immediate perceptual experience is characterised by a shaping effect which emerges from the common border of the fields and which operates only on one field, or operates more strongly on one than on the other.¹¹

One does not sense this shaping process as such, but only its effect, the mergence of a shaped figure.

The development of the figure goes through stages from instability to greater stability. These stages are illustrated in an experiment by Wever in which nonsense forms were exposed tachistoscopically from short to longer time intervals. When the figure-ground stage was reached, it appeared to have two steps. First, the figure was simple and not very stable, and then it developed into a better figure which could be grossly located in space.

The fact that figure-ground perception can be stable as well as unstable may be shown in many ways. If one looks at a Necker cube, which is produced by an outline perspective drawing, the perception is very stable. The cube fluctuates in the third dimension, now coming toward the observer, then receding.¹² Similar demonstrations can be made by using Rubin's Peter-Paul Goblet. Looking at the figure leads to fluctuations in perception (see Figure 1). Sometimes the middle vase is seen as a figure with the rest to the background; at other times the two profiles emerge as figures with the middle receding to the background. Such reversals are spontaneous and very difficult to control. One notes in these stimuli that the brightness is fairly homogenous with the only differentiation existing at the contours. The effectiveness of this differentiation is measured in its ability to direct attention towards itself. How this occurs is the next topic discussion.

Attention and Perception

Attention can be defined as the selective aspect of perception and response. Any theory of attention presupposes some general framework which fixes the nature of processing the perceptual system. One of the major ways in which attention is engaged is through the direction and control of eye movements to find stimuli of potential interest. Eye movements, however, always depend on the context of the information being sought. What we do with our eyes when they are not focused depends on the task which engages our eyes in the first place.

This suggests that two tasks seem to be involved in attention. The first is identification, which requires foveal (direct) vision, while the other concerns a decision about the direction of the next eye movement subject to the information on the periphery. Neisser suggests one way of understanding what happens when we shift from peripheral to central vision. He reasons that an object cannot be identified until it is first separated from a background. He called this segregation a "pre-attentive process." This pre-attentive process is global and allows the figure to be focused upon so that its features can be analyzed for more specific aspects. When the figure has become segregated focal attention can occur, usually by a shift in the position of the eyes. The pre-attentive process gives rise to focal attention. During pre-attentive attention a part of the field is separated into a figure, whereas during focal attention this figure is analyzed for its specific information aspects.¹³

The term focal attention is taken from Schachtel, who tried to account for the growing child's increasing interest in and understanding

of the real world without giving up the traditional analytic concern with affects and drives.¹⁴ A chief tool for this cognitive development is focal attention, ". . . man's capacity to center his attention on an object fully, so that he can perceive or understand it from many sides, as clearly as possible."¹⁵ Of course selective attention was not discovered by Schachtel. Psychologists have discussed the concept for over a century.

Since the processes of focal attention cannot operate on the whole visual field simultaneously, they come into play after preliminary operations have already segregated the figural units involved. These preliminary operations correspond in part to what Gestalt psychologists called "autochthonous forces," and they produce what Hebb called "primitive unity." Neisser calls them pre-attentive processes to emphasize that they produce the objects which subsequent processes interpret.

Neisser's approach of analysis-by-synthesis seems to be the most appropriate to this study. The pre-attentive process allows the figure to be focused upon so that its features can be analyzed for more specific aspects, in this case the embedded stimuli. If the embeds have been segregated by the pre-attentive process, focal attention can occur. The act of focal attention will direct the viewer to center attention fully on the embed so that conscious perception and awareness may occur.

The fact remains that the viewer is more likely to focus on the product or figures in the advertisements, not on the embeds, since they are much more prevalent in the layout. A study by Preston indicates that the embed may fail because the communicators' (or experimenters') labeling of the message does not assure its being seen the same way by the receiver.¹⁶ Only if the receiver segregates the embed from the ground

will the act of focal attention have a chance of occurring. Neisser's pre-attention process is the fragile link between subconscious ignorance and conscious perception.

Summary

An attempt has been made to lay a theoretical foundation upon which this study can be based. The term subliminal perception is more analogous to Miller's first two stages of awareness where the stimuli is only unconsciously attended to. The stimuli Key refers to as subliminal embed(s) are such as long as the viewer has no conscious awareness of their presence. If conscious awareness is present, embedding would by definition fall into Miller's third condition of awareness having the ability to discriminate.

If conscious perception (awareness) occurs, embedding would be analogous to the techniques of figure and ground. Yet, in the real world the product or its message is more prevalent in advertising than Key's embeds so the viewer attends to what one expects to see and not to something that one may not even realize is present. Preston states to test "the ability of theoretical typologies (embeds), data confirms that designations of rationality and emotionality may be used as predictors of various advertising effects."¹⁷ Preston's concept will be used in the testing of the hypothesis of this study.

Statement of Hypothesis

The purpose of this present study is to explore the effectiveness of embedding in advertising. Brian Wilson Key refers to embedding as the practice of hiding emotionally loaded words or figures in the

background of ads.¹² A study by Ivan L. Preston and Lawrence Bowen indicates that embedding may fail because the communicators' labeling of the message does not assure its being seen the same way by the receiver.¹⁷

The hypothesis of this study is along the same lines of Preston and Bowen. This study will seek to prove that the embedding process will have no effect on the attitudes and perceptions of the viewer. Specific areas to be tested are:

- H₁: The independent variables of order and sex are factors that affect the respondent's attitude toward the ads.
- H₂: The embedded version of the ad will be more positively evaluated than the control ad.
- H₃: The embedded version of the ad will be preferred over the control ad.

The research design of this study will be broken down into the following sequence: sample, stimuli, variables, questionnaire design, collection procedures, editing, coding, and data collection problems

END NOTES

- ¹Murch, Gerald M. "Suggestion for Clarification of Terminology in Experiments in Subliminal Stimulation," Perceptual and Motor Skills, 19 (1964), p. 442.
- ²Miller, J. C. "Discrimination Without Awareness," American Journal of Psychology, 52 (1939), pp. 562-578.
- ³Smith, G. J., and Henrickson, M. "The Effects of Established Perception on a Process Beyond Awareness," ACTA Psychology, 11 (1955), pp. 346-355.
- ⁴Key, Wilson Brian. Subliminal Seduction. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973, p. 22.
- ⁵Ibid, pp. 22-23.
- ⁶Ibid., p. 108.
- ⁷Ibid., p. 109.
- ⁸Woodsorth and Schlosbergs. Experimental Psychology. London: Methuen and Company Ltd., 1971, p. 433.
- ⁹Berelson, B., and Steiner, G. A. Human Behavior: An Inventory of Scientific Findings. New York: Harcourt, Brace and World, Inc., 1964.
- ¹⁰Rubin, E. "Figure and Ground," Ch. 13, p. 194.
- ¹¹Ibid., p. 195.
- ¹²Forgus, R. V. Perception: A Cognitive-Stage Approach. New York: McGraw-Hill, 1966, pp. 172-173.
- ¹³Ibid., p. 228.
- ¹⁴Neisser, U., Cognitive Psychology. New York: Merdith Publishing Co., 1967, p. 88.
- ¹⁵Schachtel, E. G. Metamorphosis. New York: Basic Boos, 1959, p. 251.
- ¹⁶Preston, Ivan L., and Bowen, L. "Perceiving Advertisements as Emotional, Rational and Irrational," Journalism Quarterly, Spring 1971, p. 73.

- ¹⁷Key, Wilson Brian. Subliminal Seduction, Englewood Cliffs, New Jersey: Prentice Hall, Inc., 1973, p. 22.
- ¹⁸Preston, Ivan L, and Bowen, L. "Perceiving Advertisements As Emotional, Rational and Irrational," Journalism Quarterly, Spring 1973, p. 73.

RESEARCH DESIGN

Sample

A feasible alternative to a single random sample, the ideal sample for statistical significance, is a "convenience" sample. A convenience sample is one where criteria for selecting the sampling units meets the convenience of the sampler. Some examples of convenience samples are the use of associates, a captive audience, or even "the man on the street." Convenience samples are often used in exploratory situations, such as in the study where there is only a need to get an approximation of the actual value quickly and inexpensively.¹

While the convenience sample may not be academically ideal, most advantages outweigh disadvantages. The first is the possible elimination of self-selection in the granting of interviews. Second, while the random sample may be superior in theory, there may be breakdowns in its application. If the interviewers are told to select the sample randomly, there may be a question as to how skillfully or diligently it was carried out. Third, a simple random sample that is a true cross section of the population may not be a necessary requirement of the research. Lastly, the costs and time requirements of a simple random sample may be so large that resource restrictions prohibit its use. The major disadvantage of a convenience sample may be the danger of unknown sampling bias in which sampling-induced elements distort the results.

Due mainly to the high cost and time requirements of a simple random sample, a convenience sample was selected for use in this study. Second,

a random sample that is a true cross section of the population is not a necessary requirement of this study which is merely to briefly test the effects of embedding of advertising on the observers' perception. Finally, a convenience sample was selected since the simple random design proved to be impractical.

Specifically, the population for this study were two upper division marketing classes under the direction of Dr. William Kilbourne, assistant professor of marketing on the main campus at Oklahoma State University. Being a convenience sample, the population was limited to those students present during the testing. The parameters of interest were twofold. First, measure the respondent's attitude toward the stimulus on a semantic differential scale which consisted of affective and cognitive elements. Second, to obtain the respondent's preference toward the presented stimulus. Therefore, in order to obtain these parameters, the following stimuli were used.

Experimental Stimuli

The first of the two experimental stimuli was a Marlboro Lights advertisement which appeared in House and Garden magazine in the April 1980 issue. The scene contains various symbols commonly found in the Marlboro ads: cowboys on horseback in the great outdoors. The cowboys are clad in bright yellow slickers so that they will tend to attract attention. They are riding out of a rock formation toward a large open field in the forefront of the layout. On face value the ad appears "normal," but the rock formation in the background is by no means that. Once the riders' bright yellow slickers have attracted attention toward that area of the ad, the embedding process begins. To the left of the riders is an unusual

rock formation in the shape of a hand directing attention toward the locations of the embed. Just to the right of the riders is a unique group of rocks which combine to form a large phallic symbol.

The second experimental stimulus is a Chivas Regal advertisement which appeared in the August 1980 issue of Southern Living. Here again the advertisement appears "normal" at first glance, a half-gallon bottle of Chivas Regal turned to one side to expose a metal chain that is holding the bottle in place with the caption of "how could we blame you?" The metal chain is usually the first item to attract attention. This is only natural, first due to its unique metallic nature and secondly, to its novel and eccentric use. The embed in the Chivas Regal advertisement can be found directly above the label of the bottle, specifically, the embed in the outline of a nude human posterior bent over at the waist. The figure is leaning away toward the interior of the ad with its posterior facing forward. The female gluteal region is the only use of embedding in the sense that will have bearing on this study. After close examination there are several other symbols and figures embedded in the ground but these will not have any impact into this study.

Control with Stimuli

A control version of each advertisement was constructed through the use of a technique known as "air-brushing." This photographic process eliminated the embed from each of the ads. The large phallic symbol embedded in the Marlboro Lights advertisement was broken down into two separate rock groups. The female gluteal region in the Chivas Regal advertisement was completely "brushed" out. In each case, even though the technique eliminated the embed, the consistency of the original was maintained.

Variables

Three independent variables were utilized in this study. The first was the order of presentation, both in the order of the products and the version of the pairs of ads. Would the order have any effect on the measurement of the respondent's attitudes toward the ads? Second, what effect will the sex of the observer have upon the outcome of this experiment? Finally, what effect will the different versions of the stimuli, control, and embed have on the viewer's preference among the paired sets? Will the respondents have the ability to consistently differentiate the embed from the control ad?

The dependent variable(s) for this study were twofold: First, measurement of the respondent's attitude toward each individual ad would be recorded, and second, the respondent's personal preference between each pair of advertisement. Would the independent variables of order, sex, and test versions affect the attitudes and personal preference of the viewer?

The semantic differential scale is one of the most frequently used attitude devices used in marketing research to assess the structure to organizational or brand images or the effects of advertising. The semantic differential scale was utilized in this study, specifically from a study by Churchill and Baker. The scale was broken down into two components, cognitive and affective. The cognitive elements included believable-unbelievable, informative-uninformative, and trustworthy-untrustworthy. The affective components were attractive-unattractive, impressive-unimpressive, and appealing-unappealing.

Questionnaire Design

The basic goals of this study are to obtain information concerning individual's attitude and preferences toward a set of national print ads to determine the effectiveness of embedding in advertising. In order to insure its accuracy, the information should be collected as quickly as possible after the testing has begun in order to protect the validity of the study from possible "leaks" of information concerning its nature.

The questionnaire itself was broken down into three sections, duplicated on two pages: instructions, semantic differential scales to measure the attitude toward individual advertisement and a personal preference made between the pairs of ads followed by a brief demographic question on gender.

The instructions began by stating the purpose of the study was to measure reactions (attitudes) and preference to a set of ads taken from national magazines. The final portion of the instructions illustrated the procedure for completing a semantic differential scale. The procedure included an explanation on how to interpret the rating system of the scale and a final comment that the evaluation (attitude measurement) was on the advertisement and not the product in the ad.

The semantic differential scale utilized a scale similar to that used in the Churchill and Baker study. It is a seven-point scale ranging from extremely to neutral to extremely which separate each pair of monopolar item statements.

Collection Procedures

The actual testing took place in several phases. The first and third

phases consisted of the measurements of the respondent's attitude toward each individual advertisement. The second and fourth phases entailed a paired comparison between each set of advertisement. The paired comparison technique presented the respondent with two objects at a time and required the respondent to select one of the two according to some criterion such as overall preference, tastes, or style.²

On their respective days of testing, each class was initially briefed on how to complete a semantic differential scale. The students in each class were then broken down into four similar groupings, totaling the required eight to insure randomization of order. The groups, in order, were escorted to separate rooms away from the others where a slide projector, screen, and desks (tables) were arranged to administer the questionnaires.

The questionnaires were prearranged on the desk (tables) instead of being passed out individually as the students entered for reason of control (as to where they sat) and time (to expedite the procedure). Once the students had taken their seats, the interviewer welcomed them and explained the purpose of the testing. A brief question period followed to ensure the students understood how to complete a semantic differential scale. The testing then took place with each of the groupings being exposed to a unique sequence of slides. At the end of each testing period the students were thanked for their cooperation and patience in participating in this study.

At the end of each day of testing, the projector was taken down to the original classroom to debrief the students. Before debriefing, those students who felt subconscious about the sexual connotations involved in the study were asked if they wished to leave the room. The debriefing began with a short discussion about the concept of embedding in advertising,

specifically citing Key's work in this field. A description of each of the embedded stimuli came next by giving the students a brief period of time to identify the embed on their own. The debriefing concluded by specifically directing the students' attention to the exact location of each of the embeds. This included a discussion on how each ad had been modified to eliminate the embed. It is interesting to point out that even after the debriefing, certain students could still not consciously direct their attention to become aware of the embeds.

Editing

The editing process for this study was relatively simple and straightforward. Each questionnaire was inspected for omissions and inconsistencies. Simultaneously the responses were preceded on the right margin according to a prearranged coding system. The responses for the semantic differential scales were rearranged so that a uniform sequence was maintained throughout the eight groupings. The purpose of this was to expedite the key punching process as well as aid in the prevention of accidental key punching errors.

Coding

The coding system followed the format of the questionnaire. It began with the identification of each questionnaire for reason of accountability. The next group of items concerned the independent variables involved in this study: product order, version, and gender of the respondent. The coding order of the semantic differential scales were Marlboro embedded, Marlboro control; Chivas Regal embedded, Chivas Regal control; with the attitude components of each arranged in a cognitive-effective sequence.

The respondent's preference was coded after the corresponding set of ads.

Data Collection Problems

During the process of the collection of the data, the problems of order and sex effects were taken into account. An order effect (bias) exists because there is a possibility of interaction that may bias the results of this study. Sex could bias the results by maintaining a consistently larger proportion (percentage) of one gender during any phase of collection. In order to prevent this, each group was equally balanced in gender, therefore each product would have the same probability of being viewed.

The product presentation (order) and versions were placed in a randomized order resulting in the formulation of eight unique groupings to obtain the equal possibility of presentation order. This process should eliminate the possible interaction effects on the results. Here again, each of the eight groups contained a proportional amount of each gender in an attempt to balance out any effect gender may have on the results.

DATA ANALYSIS

Experimental Design

The analysis of the data collected in this study was performed in three stages. The first stage tested for statistical significance in the independent variable of order and sex. The second stage consisted of testing for statistical significance of the independent variable of version. The final stage tested the respondent's ability to consistently select the embed over the control ad.

Paired Comparison

The use of a paired comparison technique involves presenting the respondent with two objects at a time with the requirement to select one of the two on the basis of personal preference. On balance, the paired comparison technique offers a viable approach to gathering preference type attitude data.

Statistical Testing

The first step to statistically test the significance of independent variables of sex and order is to state the null hypothesis. The null hypothesis is that the independent variables of sex and order will have no effect on the attitudes of the respondents. The alternative hypothesis states that these independent variables will have an effect on the respondent's attitudes.

The statistical test utilized was analysis of variance. In this

testing procedure the total variance in a set of data is analyzed by breaking it down into its component sources, which can be attributed to various factors in the research. The specific factors in this study are order and sex. Determination of the statistical significance of each of these factors is expressed by the various attributed to as a ratio to the estimated sampling variance of the data. This is performed by means of the F test.

In this study, the same individual was measured twice, which is referred to as a related sample. By finding the difference between each matched pair of observations, the data was collapsed into a one-sample case. That is, the number of differences, each independent of the other, can be used to compute an arithmetic mean as well as other statistics. This removed the need for the use of a MANOVA table, thereby allowing for the use of an ANOVA for each type of dependent variable.

The desired level of significance will be .05 which is the common standard of such tests.³ The computation of both the calculated and critical test value(s) were performed through the use of the SAS-packaged program at the computer center on the main campus at Oklahoma State University. The specific values for the F-value and probability were:

Item	Difference	F-Value	PR G.T. F
	MCD	0.83	0.6411
	MAD	0.83	0.6427
	CCD	1.44	0.1619
	CAD	0.74	0.7365

In all cases, the calculated F-Values were less than the critical values (PR less than 9.9500). These findings would support the null hypothesis that the independent variables of order and sex have no statistical significant effect on the attitude of the respondents.

The second stage in the analysis of the data was to test for the

statistical significance of the differences between the attitude components for each set of ads. The first step was to refer back to the null hypothesis that there will be no difference between the attitudes toward each pair of advertisements. The alternative hypothesis was that a positive difference between the pairs would result.

The t-test was chosen to statistically test the significance of each difference. Here again the 5-test, a parametric test, would have normally been inappropriate for such a case since one of its basic assumptions is that the observations are independent. This problem was overcome by calculating the differences between each pair as was the case for the ANOVA.

The desired level of significance used for this test was 0.05. The calculated and critical values were again generated by SAS:

<u>items</u>	<u>t value</u>	<u>PR G.T. ITI</u>
MCD	- 1.37	0.1754
MAD	- 0.46	0.6448
CCD	- 0.17	0.8691
CAD	- 0.18	0.8543

In each case the null hypothesis was not rejected. These results indicate support for the null hypothesis in that the different versions of each ad had no significant effect of the attitude of the respondent.

The third stage of this analysis tested the statistical significance of the paired comparison tests. The null hypothesis for this test was that each version, embedded and control, had an equal probability of being chosen ($H_0: p = p_0$). The alternative hypothesis was that the embedded version had a greater probability of being selected ($H_a: p \text{ g.t. } p_0$).

The statistical test was a procedure used to test the binomial parameter p . This test was selected because it was tailor-made to suit the

specific requirements of the paired comparison test. The observed significance level utilized was 0.05. The value (Z) of the statistic was calculated through the following formula.⁴

$$Z = \frac{X - np_o}{\sqrt{np_o(1-p_o)}}$$

X: number of successes
n: sample size
Po: State probability from the null hypothesis

$$Z_M = \frac{36 - 69(.5)}{\sqrt{69(.5)(1-.5)}}$$

$$Z_C = \frac{35 - 69(.t)}{\sqrt{69(.5)(1-.5)}}$$

$$Z_M = .3611$$

$$Z_C = .1203$$

$$Z_O = 1.65$$

These preliminary results would not support the rejection of the null hypothesis.

Results

The objective of this study was to determine the effectiveness of embedding in advertising. These hypotheses were specifically tested:

- H₁: The independent variables of order and sex are factors that affect the respondent's attitude toward the ad.
- H₂: The embedded version of the advertisement will be more positively evaluated than the control ad.
- H₃: The embedded version of the advertisement will be preferred over the control ad.

The first hypothesis was tested with the analysis of variance (ANOVA). The analysis was performed on the differences between the attitude components for each set of advertisements. Therefore, four ANOVA tables were performed, two for the cognitive differences between each set of ads and two for the affective differences between each set of ads. Below is a brief summary of the findings; for a complete listing please refer to the appendixes:

Dependent variable	DF	F Value	PR G.T. F
MCD	15	0.83	0.6411
Source			
P	1	0.19	0.6608
M	1	0.13	0.7163
C	1	0.41	0.5272
S	1	0.01	0.9226
MAD	15	0.83	0.6427
P	1	0.24	0.6273
M	1	0.05	0.8326
C	1	0.89	0.6273
S	1	1.56	0.2177

Dependent variable	DF	F Value	PR G.T. F
CCD	15	1.44	0.1619
Source			
P	1	0.73	0.3955
M	1	0.02	0.8797
C	1	0.26	0.6129
S	1	0.50	0.4821
CAD	15	0.74	0.7365
Source			
P	1	0.83	0.3668
M	1	0.00	0.9813
C	1	1.19	0.2808
S	1	0.78	0.3608

As illustrated by the ANOVA table, the null hypothesis cannot be rejected at the 0.05 level of significance. None of the variables in any of the cognitive and affective components approached the 0.05 level necessary to reject the null hypothesis. The data in this case would support the hypothesis that the variables of order, both in product order and in the version order of the ads, and sex have no apparent relationship with the dependent variable of attitude. This does not prove that there is absolutely no relationship, but the data collected in this study would support the hypothesis.

The second hypothesis was analyzed through the use of the t-test with the results listed below:

Variable	T	PR G.T. ITI
MCD	-1.37	0.1754
MAD	-0.46	0.6448
CCD	-0.17	0.8691
CAD	-0.98	0.8543

The results from the t-test were consistent with the findings of the ANOVA. The statistics indicate support for the null hypothesis that there will be no difference between the respondent's attitude toward each set of ads.

The binomial parameter p was used to test the third hypothesis to examine the respondent's ability to choose the embedded version. The values were:

$$Z_M = 0.3611$$

$$Z_C = 0.1203$$

The critical value 0.05 of 1.65 was the larger in both cases which would support the null hypothesis that the probability of the respondents' ability to choose the embedded version was no more than a fifty-fifty chance. Each of the versions in the sets of advertisements had an equal chance of being selected being consistent with the previous tests.

Discussion

The results during each phase of the testing were not inconsistent with expectations the product or its message was more prevalent in the advertisements than the embeds. The viewers attend to what is expected to be seen, which is the product or message, not to something that is not. Preston indicated that the embed may fail because the labeling of the message does not assure its being seen the same way by the viewer. Conscious awareness of the embedded stimuli failed to occur in this

study. Neisser's pre-attentive processes did not allow the embed to be segregated from the ground so focal attention could be directed toward it. This fact was illustrated throughout the hypothesis testing.

The independent variables of order and sex appear to have no significant effect on attitudes of the respondents. The ANOVA table did not support the anticipated relationships between the independent sex and order variables and the dependent attitude components.

Preston formulates that cognitive and affective components can be used to compare the effectiveness of perceived ads. This approach was utilized to test the effectiveness of the embedded stimuli. If the embed had had any effect on the perception of the advertisement, then it would have been measured by the cognitive and affective components. The results of the t-test did not support any positive-effect relationship between the embedded stimuli and the perception of the ads.

Berelson and Steiner support the position that embeds lack effectiveness in stimulating action.⁵ This is consistent with the paired comparison tests. If the embed was effective in stimulating action, then the effects would have been illustrated in the findings of this study, which was not the case. The respondent's preference during the paired comparison was little more than chance.

Each phase of this study supports the position that effectiveness of embedding in advertising is questionable. These findings would imply a weak basis for those firms utilizing embedding in their advertising. The embedding process was not supported as being a positive factor in stimulating attention. Pre-attentive processing failed to segregate the embed from the ground. Therefore the viewer's full attention was not directed toward the location of the embed so conscious perception and awareness

could not occur. The embeds did not make the transition into the conscious mind of the observer.

ENDNOTES

- ¹Tull, Donald P., and Hawkins, D. I. Marketing Research: Meaning, Measurement and Method. New York: Macmillan Publishing Co., 1976, p. 160.
- ²Ibid., p. 340.
- ³Emory, C. W. Business Research Methods. Homewood, Illinois: Richard D. Irwin, Inc., 1976, p. 135.
- ⁴Harnett, Donald L., Introduction to Statistical Methods. Reading, Massachusetts: Addison-Wesley Publishing Co., 1970, p. 246.
- ⁵Berelson, B., and Steiner, G. A. Human Behavior: An Inventory of Scientific Findings. New York: Harcourt, Brace and World, Inc., 1964.

BIBLIOGRAPHY

- Aaker, David A., and Day, George S. Marketing Research: Private and Public Sector Dimensions. New York: John Wiley & Sons, 1980.
- Baker, Michael J., and Churchill, Gilbert A., Jr. "The Impact of Physically Attractive Models on Advertising Evaluations," Journal of Marketing Research, Vol. 14 (November 1977), pp. 538-555.
- Berelson, B., and Steiner, G. A. Human Behavior: An Inventory of Scientific Findings. New York: Harcourt, Brace and World, Inc., 1964.
- Bevan, William. "Subliminal Stimulation: A Pervasive Problem for Psychology," Psychological Bulletin, Vol. 61, No. 2 (February 1964), pp. 88-97.
- Daniels, Peter, and Lawford, John. "The Effect of Order in the Presentation of Samples in Paired Comparison Product Tests," Journal of Market Research Society, Vol. 16, No. 2 (April 1974), pp. 127-133.
- Emory, C. William. Business Research Methods. Homewood, Illinois: Richard D. Irwin, Inc., 1976.
- Eriksen, C. W. "Subception: Fact or Artifact?" Psychological Review, Vol. 63 (1956), pp. 74-80.
- Forgus, Ronald H., and Memamell, Lawrence E. Perception: A Cognitive-Stage Approach, New York: McGraw-Hill, 1976.
- George, Stephen G., and Jennings, Luther B. "Effect of Subliminal Stimuli on Consumer Behavior: Negative Evidence," Perceptual and Motor Skills, Vol. 41 (1975), pp. 847-854.
- Harnett, Donald L. Introduction to Statistical Methods. Reading, Massachusetts: Addison-Wesley Publishing Co., 1970.
- Hawkins, Del. "The Effects of Subliminal Stimulation on Drive Level and Brand Preference," Journal of Marketing Research, Vol. 7 (August 1970), pp. 322-326.
- Hochberg, Julian E. Perception. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.
- Horowitz, Leonard M. Elements of Statistics for Psychology and Education. New York: McGraw-Hill, 1974.
- Kahneman, Daniel. Attention and Effort. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.

- Key, Wilson Brian. Subliminal Seduction. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1973.
- Kerlinger, Fred N. Behavioral Research: A Conceptual Approach. New York: Holt, Rinehart and Winston, 1979.
- Kurtz, Ronald. Marketing Research: Strategy and Techniques. Braintree, Massachusetts: D. H. Mark Publishing Co., 1969.
- Lazarus, Richard S. "Subception: Fact or Artifact? A Reply to Eriksen," Psychological Review, Vol. 63, No. 5 (1956), pp. 343-347.
- Luck, David L.; Wales, Hugh G.; Taylor, Donald A. Marketing Research. Meredith Corp., 1970.
- Naylor, J. C., and Lawshe, C. H. "An Analytical Review of the Experimental Basis of Subception," The Journal of Psychology, Vol. 46 (1956), pp. 75-96.
- Neisser, Ulric, Cognition and Reality. San Francisco: W. H. Freeman & Co., 1976.
- Preston, Ivan L. "Logic and Illogic in the Advertising Process," Journalism Quarterly, (Summer 1967), pp. 231-237.
- Preston, Ivan L., and Bowen, Lawrence. "Perceiving Advertisements as Emotional, Rational, and Irrational," Journalism Quarterly, (Spring 1971), pp. 73-84.
- Schachtel, E. G. Metamorphosis. New York: Basic Books, 1959.
- Steadman, Major. "How Sexy Illustrations Affect Brand Recall," Journal of Advertising Research, Vol. 9, No. 1, pp. 15-19.
- Tull, Donald S., and Hawkins, Del I. Marketing Research: Meaning, Measurement and Methods. New York: Macmillan Publishing Co., Inc., 1976.
- Warwick, Donald P., and Lininger, Charles A. The Sample Survey. New York: McGraw-Hill, Inc., 1975.
- Woodworth & Schlosbergs. Experimental Psychology. London: Methuen & Company, Ltd., 1971.
- Worichester, Robert M. Consumer Market Research Handbook. London: McGraw-Hill, 1972.

APPENDIX

LIST OF SYMBOLS

P	presentation order of products
M	order of Marlboro versions
C	order of Chivas Regal versions
S	sex of the respondent
MW_	attitude item from Marlboro embedded version, number at blank indicates specific attitude item
MO_	attitude item from Marlboro control version, number at blank indicates specific control item.
CW_	attitude item from Chivas Regal embedded version, number at blank indicates specific attitude item
CO_	attitude item from Chivas Regal embedded version, number at blank indicates specific attitude item
MCW	sum of embedded Marlboro cognitive items
MCO	sum of embedded Marlboro cognitive items
CCW	sum of embedded Chivas Regal cognitive items
CCO	sum of Chivas Regal cognitive items
MAW	sum of embedded Marlboro affective items
MAO	sum of control Marlboro affective items
CAW	sum of embedded Chivas Regal affective items
CAO	sum of control Chivas Regal affective items
MCD	Marlboro cognitive items difference (MCW-MCO)
MAD	Marlboro affective items difference (MAW-MAO)
CCD	Chivas Regal cognitive items difference (CCW-CCO)
CAD	Chivas Regal affective items difference (CAW-CAO)

Instructions: The purpose of this study is to measure your reaction and preference to a set of ads taken from national magazines. For each ad, you are to complete the corresponding set of scales and determine your preference.

To complete the scales, you would proceed as follows. If you believe that an ad is "very" good, you would place an "X" in the blank corresponding to "very" good as follows:

Extremely Very Moderately Neutral Moderately Very Extremely
 Good _____ X _____ _____ _____ _____ _____ Bad

If you thought the ad was "extremely bad, you would place the "X" under the "extremely" closest to "bad." Please remember that it is your evaluation of the advertisement and not the product that is needed.

Ad: Marlboro-1

	Extremely	Very	Moderately	Neutral	Moderately	Very	Extremely	
Attractive	_____	_____	_____	_____	_____	_____	_____	Unattractive
Unimpressive	_____	_____	_____	_____	_____	_____	_____	Impressive
Appealing	_____	_____	_____	_____	_____	_____	_____	Unappealing
Informative	_____	_____	_____	_____	_____	_____	_____	Uninformative
Unbelievable	_____	_____	_____	_____	_____	_____	_____	Believable
Untrustworthy	_____	_____	_____	_____	_____	_____	_____	Trustworthy

Ad: Marlboro-2

	Extremely	Very	Moderately	Neutral	Moderately	Very	Extremely	
Attractive	_____	_____	_____	_____	_____	_____	_____	Unattractive
Unimpressive	_____	_____	_____	_____	_____	_____	_____	Impressive
Appealing	_____	_____	_____	_____	_____	_____	_____	Unappealing
Informative	_____	_____	_____	_____	_____	_____	_____	Uninformative
Unbelievable	_____	_____	_____	_____	_____	_____	_____	Believable
Untrustworthy	_____	_____	_____	_____	_____	_____	_____	Trustworthy

Personal Preference Ad-1 Ad-2

Sex: Male _____ Female _____

Instructions: The purpose of this study is to measure your reaction and preference to a set of ads taken from national magazines. For each ad, you are to complete the corresponding set of scales and determine your preference.

To complete the scales, you would proceed as follows. If you believe that an ad is "very" good, you would place an "X" in the blank corresponding to "very" good as follows:

Extremely Very Moderately Neutral Moderately Very Extremely
 Good _____ X _____ _____ _____ _____ _____ Bad

If you thought the ad was "extremely bad, you would place the "X" under the "extremely" closest to "bad." Please remember that it is your evaluation of the advertisement and not the product that is needed.

Ad: Marlboro-1

	Extremely	Very	Moderately	Neutral	Moderately	Very	Extremely	
Attractive	_____	_____	_____	_____	_____	_____	_____	Unattractive
Unimpressive	_____	_____	_____	_____	_____	_____	_____	Impressive
Appealing	_____	_____	_____	_____	_____	_____	_____	Unappealing
Informative	_____	_____	_____	_____	_____	_____	_____	Uninformative
Unbelievable	_____	_____	_____	_____	_____	_____	_____	Believable
Untrustworthy	_____	_____	_____	_____	_____	_____	_____	Trustworthy

Ad: Marlboro-2

	Extremely	Very	Moderately	Neutral	Moderately	Very	Extremely	
Attractive	_____	_____	_____	_____	_____	_____	_____	Unattractive
Unimpressive	_____	_____	_____	_____	_____	_____	_____	Impressive
Appealing	_____	_____	_____	_____	_____	_____	_____	Unappealing
Informative	_____	_____	_____	_____	_____	_____	_____	Uninformative
Unbelievable	_____	_____	_____	_____	_____	_____	_____	Believable
Untrustworthy	_____	_____	_____	_____	_____	_____	_____	Trustworthy

Personal Preference Ad-1 Ad-2

Sex: Male _____ Female _____

RANDOMIZATION OF PRODUCT ORDER

1 - 2 - 3 - 4

1 - 2 - 4 - 3

2 - 1 - 4 - 3

2 - 1 - 3 - 4

3 - 4 - 1 - 2

3 - 4 - 2 - 1

4 - 3 - 2 - 1

4 - 3 - 1 - 2

- 1 Marlboro embedded advertisement
- 2 Marlboro control advertisement
- 3 Chivas Regal embedded advertisement
- 4 Chivas Regal control advertisement

RESULTS OF ANOVA TABLE

Dependent Variable:	CCD	DF	F VALUE	PR G.T. F
<u>Source</u>				
	MODEL	15	1.44	0.1619
	ERROR	53		
	Corrected total	68		
<u>Source</u>				
	P	1	0.73	0.3955
	C	1	0.26	0.6129
	P*C	1	1.25	0.2692
	M	1	0.02	0.8797
	P*M	1	0.42	0.5182
	C*M	1	3.52	0.6661
	P*C*M	1	1.03	0.3150
	S	1	0.50	0.4821
	P*S	1	0.89	0.3487
	C*S	1	0.12	0.7301
	P*C*S	1	7.81	0.0072
	M*S	1	0.48	0.3242
	C*M*S	1	0.54	0.4654
	P*C*M*S	1	3.08	0.0853

Dependent Variable:	CAD	DF	F VALUE	PR G.T. F
<u>Source</u>				
	MODEL	15	0.74	0.7365
	ERROR	53		
	Corrected total	68		
<u>Source</u>				
	P	1	0.83	0.3668
	C	1	1.19	0.2808
	P*M	1	1.67	0.2019
	C*M	1	0.00	0.9813
	P*C*M	1	0.01	0.9071
	S	1	0.15	0.6992
	P*S	1	1.20	0.2609
	C*S	1	2.12	0.1509
	P*C*S	1	0.00	1.0000
	M*S	1	1.47	0.2315
	P*M*S	1	0.08	0.7781
	C*M*S	1	0.02	0.8891
	P*C*M*S	1	0.77	0.3857

RESULTS OF ANOVA TABLE

Dependent Variable:	MCD	DF	F VALUE	PR G.T. F
<u>Source</u>				
MODEL		15	0.83	0.6411
ERROR		53		
Corrected total		68		
<u>Source</u>				
P		1	0.19	0.6608
C		1	0.41	0.5272
P*C		1	0.65	0.4227
M		1	0.13	0.7163
P*M		1	0.03	0.8709
C*M		1	0.76	0.3865
P*C*M		1	0.76	0.3867
S		1	0.01	0.9226
P*S		1	0.32	0.5748
C*S		1	1.74	0.1934
P*C*S		1	0.00	1.0000
M*S		1	1.43	0.2365
P*M*S		1	3.07	0.0855
C*M*S		1	3.03	0.8876
P*C*M*S		1	0.31	0.5826

Dependent Variable:	MAD	DF	F VALUE	PR G.T. F
<u>Source</u>				
MODEL		15	0.83	0.6427
ERROR		53		
Corrected total		68		
<u>Source</u>				
P		1	0.24	0.6273
C		1	0.89	0.3495
P*C		1	1.01	0.3197
M		1	0.05	0.8326
P*M		1	1.31	0.2579
C*M		1	1.35	0.2490
P*C*M		1	0.85	0.3611
S		1	1.56	0.2177
P*S		1	0.48	0.2177
C*S		1	0.35	0.5555
P*C*S		1	0.00	1.0000
M*S		1	0.59	0.4451
P*M*S		1	3.22	0.0758
P*C*M*S		1	0.00	1,0000

VITA

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